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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,102	03/16/2004	Marc Schaepkens	RD-28,965-4	3228

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
NISKAYUNA, NY 12309

EXAMINER	
BURKHART, ELIZABETH A	

ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
11/26/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/802,102	SCHAEPKENS, MARC	
	Examiner	Art Unit	
	Elizabeth Burkhart	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *60-103* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *60-103* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/16/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The Related Application data in the amendment to the specification filed 7/5/2004 states that the instant application is a Continuation Application of US Application 10/063917, now US Patent 6743524, but the instant application is a Divisional Application of the aforementioned US Application. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 78-80, 83-85, and 101-103 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear which range is being claimed in the above claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 60-62, 65, 66, 68-70, 73, 78, 81-83, 86, 89, 90, 92-94, 97, and 101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas et al ('510) in view of Creatore et al.

Thomas discloses a method of forming a barrier layer on a substrate wherein the OTR and WVTR are less than 2 g/m^2/day. The substrate material may be PET and the barrier layer may be silicon oxide. The silicon oxide layer is deposited by introducing an organosilicon, such as HMDSO or disilanes, to a chamber in which an oxygen plasma is formed (Abstract, Col. 2, line 57- Col. 3, line 18, Col. 7, line 65).

Thomas does not disclose using an expanding thermal plasma having an electron temperature less than 1 eV or that the precursor is deposited onto the substrate at a rate of at least 200 nm/min.

Creatore discloses using an expanding thermal plasma to deposit silicon oxide films from HMDSO precursor and oxygen in order to deposit films at high deposition rates, such as 480-600 nm/min (Abstract, A19.3.1). The electron temperature is 0.3 eV (A19.3.2).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to incorporate the expanding thermal plasma of Creatore into the process of Thomas in order to deposit silicon oxide films at high deposition rates.

Thus, claims 60-62, 65, 66, 68-70, 73, 78, 81-83, 86, 89, 90, 92-94, 97, and 101 would have been obvious within the meaning of 35 USC 103 over the combined teachings of Thomas and Creatore.

4. Claims 63, 67, 71, 79, 80, 84, 85, 87, 91, 95, 102, and 103 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas in view of Creatore as applied above and further in view of Yang et al ('544).

Thomas and Creatore do not disclose that the barrier layer is titanium oxide.

Yang discloses an expanding thermal plasma method to form a protective coating on a substrate at a high deposition rate wherein the protective coating is an oxide of silicon, titanium or zinc. The protective coating is deposited at rates of up to 20,000 nm/min. Precursors for a silicon oxide coating include HDMSO and oxygen and precursors for titanium oxide deposition include titanium isopropoxide. Substrate materials include metal, glass, and plastics (Col. 1, line 67, Col. 2, lines 36-54, Col. 4, lines 47-54, Col. 6, lines 48-56).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to use the processes of Thomas and Creatore to deposit other barrier coatings, such as titanium oxide, at high deposition rates using an expanding thermal plasma as suggested by Yang.

Regarding Claims 67 and 91, Yang discloses that the barrier coatings may be deposited onto substrates made of steel (Col. 9, line 1). Thus, it would have been obvious to use a steel substrate in any form, such as a metallic web comprising steel, with a reasonable expectation of success.

Thus, claims 63, 67, 71, 79, 80, 84, 85, 87, 91, 95, 102, and 103 would have been obvious within the meaning of 35 USC 103 over the combined teachings of Thomas, Creatore, and Yang.

5. Claims 72 and 96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas in view of Creatore as applied above and further in view of Namiki et al ('778).

Thomas and Creatore do not disclose using a metal chloride as a precursor.

Namiki discloses a plasma deposition method for improving the gas barrier properties of plastic containers by forming a film onto said container (Col. 2, lines 17-21). The container may be a PET container (Col. 6, line 34) and the precursor may be a metal halide. A metal oxide may be formed using oxygen gas (Col. 9, lines 20-26).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to use a metal chloride as suggested by Namiki as an alternative precursor to the organic precursors used in the processes of Thomas and Creatore.

Thus, claims 72 and 96 would have been obvious within the meaning of 35 USC 103 over the combined teachings of Thomas, Creatore, and Namiki.

6. Claims 64, 74-76, 88, and 98-100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas in view of Creatore as applied above, and further in view of Hoshikawa ('991).

Thomas and Creatore do not disclose depositing at least one layer on one of the barrier layer and the substrate.

Hoshikawa discloses a method of forming a LCD panel wherein a barrier layer, silicon oxide (Col. 5, line 12), is formed on a plastic substrate, PET (Col. 3, lines 15), to decrease permeability to air and water vapor (Col. 1, lines 30-42). A conductive film, such as tin oxide, indium oxide, or ITO, is formed on the substrate (Col. 3, line 6). A polymer layer may also be formed on the substrate as an orientation layer (Col. 6, lines 3-5).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to form a LCD display as suggested by Hoshikawa using the plasma processes of Thomas and Creatore in order to deposit the silicon oxide barrier layer onto the PET substrate at a high deposition rate which would decrease the overall process time of forming the display.

Thus, claims 64, 74-76, 88, and 98-100 would have been obvious within the meaning of 35 USC 103 over the combined teachings of Thomas, Creatore, and Hoshikawa.

7. Claim 77 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas and Creatore in view of Hoshikawa as applied above, and further in view of Fukuchi et al ('901).

Thomas, Creatore, and Hoshikawa do not disclose depositing at least one layer of a hybrid organic-inorganic material on one of the barrier layer and the substrate.

Fukuchi discloses forming a device for a LCD display comprising providing a substrate (PET), depositing a siloxane layer (Col. 1, line 50-Col. 2, line 20), depositing a

metal oxide layer (oxides of Si, Al, or Ti), and depositing an ITO layer (Col. 9, lines 35-55). The siloxane layer is used for an improved hard coat effect (Col. 10, lines 10-15).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to incorporate a siloxane coating as suggested by Fukuchi into the processes of Thomas, Creatore, and Hoshikawa in order to form a LCD display with an improved hard coat effect.

Thus, claim 77 would have been obvious within the meaning of 35 USC 103 over the combined teachings of Thomas, Creatore, Hoshikawa, and Fukuchi.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Burkhart whose telephone number is (571) 272-6647. The examiner can normally be reached on Monday-Thursday, 7:00 AM-5:30 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

eab

TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER